[For The Progressive Farmer.

THE CHEMISTRY OF WINE.

In a short paper of this character I can give only a brief outline of the chemistry of wine. My aim is rather to point out how the science of chemistry has been and can be useful to the wine maker, and to emphasize the importance of the grape industry in this State.

That grapes can be grown successfully in North Carolina is a fact well established now by experiment. The task that remains is to find the best varieties and the best localities and to learn how to dispose of the crop to the greatest advantage. There is a most promising outlook for a profitable utilization of the grapes in wine-making. The great destruction of vineyards in Europe by the phylloxera, the consequent adulteration of the wines imported into this country, and the call for the pure home-made article, are all cogent reasons why the industry should flourish among us. It is true that much of the American made wine is sold under foreign labels and can only find sale in that way, but this is due to two facts: first, the strong hold which recognized brands have on the public, and secondly, American manufacturers are new to the business and lack skill in picking, sorting, fermenting and blending so that the home product is frequently crude, if I may so express it, and hence not so attractive.

Now against the first fact fraud and adulteration are so working that the reputation of the brands is being lost, or rather the public despairs of getting the genuine article. With regard to the second, I feel confident we can learn to do better and can acquire the needed skill if properly directed.

To understand our subject, we must know the characteristic constituents of wine and in examining into the nature of these substances it is important to know first what are the original constituents of the grape. The average of many analyses (Koenig. Die Menschlichen Nahrungs u. Genussmittel II. 550) of German grapes is, water 78.17, albumen 59.59, sugar 14.36, acid .79, hulls 3.60, ash 50, nitrogen free matter 1.96. I purpose next year, if possible, to examine our native Scuppernongs and see how they compare with the German grapes.

Now the wine made from those grapes contains water, alcohol coming from the fermentation of the sugar, glycerine from the same source, a little sugar unchanged—a little albumen, and some yeast not gotten rid of during the clarifying. There is also some gum and kindred unknown substances which form part of the extract or the body of the wine.

Of acid substances we have chiefly tartaric, some malic, and according to the handling of the wine, more or less acetic or vinegar.

We find also tannic acid, valuable for keeping its keeping qualities, and coloring matter in greater or lesser amount, according to the grape and according as to whether it is red or white wine. There is always a small proportion of mineral matter present, and lastly a minute amount of certain ethers, so small an amount that we hardly get hold of them in an analysis. These ethers give the bouquet or bloom.

These are the most important constituents and will suffice for our purpose now, but one can understand how really complex a liquid wine is when I state that there are between forty and fifty different substances in all present in it.

Knowing then the contents of wine, its artificial manufacture is an easy thing, and it is made on a very large scale, the main things needed for the manufacture being sawdust, sulphuric acid, coal-tar and water, other substances being used in very small amount, and so close an imitation of genuine wine can be made in this way that even a chemist, unless skillful, might be deceived by it. But of course it is not wine, and we need say no more about it. Many things are added to genuine wine, however, and we can briefly mention some of those.

First, alcohol in the form of brandy may be added. This is known as fortifying the wine. It is a little singular that alcohol was not known until during the middle ages, nor was brandy made until then. It was first introduced as a medicine, but the sick became fond of it. It was soon regarded as a sovereign remedy for all diseases (some retain that idea to the present day). I suppose lengthy and frequent sicknesses became fashionable. In 1570, when the plague threatened Sweden, the doctors administered brandy indiscriminately as a preventive, and by this means its use was introduced into that country.

Another legalized addition is sugar, sweetening the wine. We have also "wetting" where water is added and "blending" where wines are mixed, a most delicate and important operation.

Objectionable additions are plaster before fermentation, to strengthen the wine and salicylic acid afterwards to preserve the wine from souring—alum in clarifying and copperas and others of lesser moment. Fraudulent adulterations of wine seem to be as old as wine itself. In the days of the Romans we read of aging processes, preservatives, plastering, &c.

As to the fermentation which changes the grape juice, or must, into wine, a chemist finds much to study in such a process and the studies of chemists have been of immense service to wine-makers and beer-brewers in this most important part of their business.

The fermentation is caused by germs in the air. These find in the juice just the conditions suited for their life and propagation, provided the juice is kept at the right temperature. A tub of juice is exposed to the air. These germs alight in it. In a few hours they begin to multiply and to live upon the sweet liquid. By these life-processes the sugar is changed to alcohol and the tub foams with the carbonic acid given off. Now there are many kinds of these germs in the atmosphere, and others are hanging over that fermenting tub waiting until the foam subsides or the temperature rises high enough for them to set to work also. The wine-maker must understand well the needs and habits of these small fry. He must distinguish friend from foe—offer his hospitality to the one and skillfully fend off the other. During the fermenting season I am told that the French wine men spend a sleepless, anxious time and even with the greatest precautions some times a large part of an entire vintage is lost.

I thought at one time of enumerating the services which chemists have rendered to the wine industry, intending it as an offset to the harm which you may think they have wrought in making the way clear for artificial wine-making. The limits of our time however, forbid We must pass by Chaptal, Schutzenberger and others, but at least can mention Pasteur, whose work has saved millions of dollars to France. The pasteurizing of wine is but one of many of his suggestions, yet that alone was enough to immortalize any man. This pasteurizing is the basis of our great canning industry. So great has been the benefit derived from scientific research and experiment in wine-making that several nations have established viticultural stations where, under trained hands, experiments are being constantly carried on as to the best wine grape for that section, its needs in the way of soil, fertilizer and cultivation the best modes of fermentation whether in Perret's frames or open vats, with foulage or without, the most suitable temperature, &c., &c. In fact, they seek to find the best solutions to the many problems and questions which rise to puzzle the maker of wine. In this country only one such station exists, so far as I am aware, and that is in California.

It may be asked why a special station need be established for such work, why not perform these experiments in the wineries. The reasons are not far to seek. In the large wineries everything is done for profit, and few manufacturers can afford to expend time, labor and money on costly experiments. Again in a large winery it is very difficult to have an experiment cut off from the regular work and to prevent ignorant workmen from interfering with it.

The aim of the California station is to experiment with soils, grapes, wines and blends so as to insure a uniform product from the vineyards and build up a lasting reputation for the California wines and they have done much already to secure these ends though working only six years. Up to the establishment of the station in 1881, each maker in the State exercised his own judgment, followed no rules, consulted no one's taste, and hence the product was an exceedingly varying one; could not be relied on and failed to meet with ready sale. These are just the reproaches that I have heard made against the wines of this State.

I have mentioned the frauds and adulterations which so greatly interfere with the wine industry. Their great increase has necessitated the establishment of analytical laboratories where the wines are analyzed and the public warned against fraudulent ones. In 1881 one such was established in Paris, and now every large city in France has one. Government inspectors take samples there to be analyzed, and for a small sum private persons can have samples examined. We will undoubtedly have to establish such laboraties in this country before long. They were rendered necessary in France by the fraud following upon the devastations of the phylloxera. In 1879 1,250,000 acres of vineyards were destroyed by this pest and the same number seriously injured. The production was decreased by 800,000,000 gallons; yet the consumption and exportation remained the same. To make up the deficiency, inferior wines were brought in from Spain and Italy and manufactured wines were made from raisins and other more objectionable things. To show the amount of fraud, I find in one year in the Municipal Laboratory of Paris 3,001 samples of wine were examined. Of these 1731 were bad, 991 passable, and 279 good, and the average convictions per year in France for adulteration of wines and medicine have been 3.398. The Trade Government is careful lest injury should fall upon its subjects. We can only protect ourselves by taking similar steps, examining carefully all imported articles and building up these industries at home so as to insure purity.

As a subject of interest to ourselves and of importance to the State, Dr. Phillips and myself have analyzed such of North Carolina wines as we could procure. We wished to see what was made in the State and its nature. If possible, I hope to follow up this investigation by others going more deeply into the subject. Especially do I wish to see if our native grape, the Scuppernong, cannot be better utilized. It will give me great pleasure during my less busy seasons to do whatever I can in the way of analysis and chemical research to promote the grape industry of the State.

[We greatly regret that we are not prepared to publish a table sent us by Prof. Venable showing the analysis of some of our native wines and in comparison with some of the imported wines.—Ed.]

[For The Progressive Farmer.

INEQUALITY OF LAW.

Brethren of the Farmers' Alliance, one of the greatest disadvantages that the people of North Carolina have to contend with is inequality of law. In these days of adversity, the great wheel of agriculture is to be seen by every eye to move slower and slower in its revolutions every year, and that wheel which is the foundation and propeller of every industry on the face of the earth receives today less attention from our law-making bodies than any other industry of any importance in existence. The farmers have met in convention; they have passed resolutions making known to some extent our many wants and needs, and how much attention has been paid to the pleadings of the horny-handed men of toil, men who by their sweat and wearing away of their very existence keep the many millions of people in these United States from want and starvation? Are we to receive no protection from the hands of the law?

My brethren, we are no grumblers. We have withstood the yoke of oppression long enough, and now necessity compells us to not only ask, but demand, that our interest, as well as those of monopolies and corporations, should receive its just share of the benefits and protection of this government. One of the greatest outrages that we are subjected to is inequality of taxation. The negroes pay but little tax and share equally with the whites so far as deriving the benefit of educating their children in free schools is concerned. It is as easy for a man to pay his poll tax as it is for a man owning five hundred acres of land to pay his. It is no more in proportion, and if he has spent his money foolishly, it is his own lookout; he ought to be made to pay, and if he does not, I say he ought to be disfranchised from voting or put in the work house and made to work out his taxes. I have no objection to the negro being educated, but in the name of the oppressed poor don't let it be done at the expense of the white people's labor. You may say that it is unconstitutional to separate the taxes and establish separate schools with the amounts paid in. Well, if it is constitutional to rob one class to benefit another, I say change the constitution, and if that cannot be done, and our money cannot go to educate our children, I say do away with the schools. A man who has worked and accumulated a little property is certainly entitled to it, and he should not be compelled to pay taxes on his farm when the loafers and idlers go free and their children, at the working man's expense, receives as much benefit from free schools as the man who sweats and toils to educate his.

Brethren, this one subject has created more dissatisfaction than any other one thing of its nature that we have to contend with, and it is an absolute necessity that our leading men should take hold of such matters and see that our rights are vindicated. I am afraid if our legislatures and Congress do not take hold and right the people that in less than ten years this government will stand like a tree on rotten roots. It is a necessity that our children shall be educated in order to take the reins in hand when we are gone; and how upon earth can they be when we are robbed and taxed to educate those who will not so much as pay a poll tax for this purpose?

This generation cannot last always and we have got to hand down the reins to our posterity, and should the sun of intelligence cease to shine in this fair land of ours, it would soon become the hot bed of Nihilism. Nihilistic views are fast gaining ground in this country and it will take intelligence and education to crush it out. Such views are easily instilled into the minds of the ignorant.

One more thought: See how the laws give the capitalists and speculators the advantage of the farmer. If a man has $10,000 in bank the 30th day of May, he can go and have it changed into treasury notes (legal tenders) and thereby keep from paying one cent of tax on his money while if a farmer has $10,000 in a plantation, he is compelled to pay his tax or his land is sold. Now is it not as just and equitable for this speculator to pay tax on his money on deposit as the farmer to pay on his hard-earned farm?

How long before a Moses will rise in our midst to deliver us from these cruel ties of bondage?

Yours fraternally,

M. F. A.

[For The Progressive Farmer.

THE LE CONTE PEAR.

Thomasville, Ga., Nov 8, '87.

No fruit tree is attracting so much attention in this section at the present time as the Le Conte pear tree, and it would seem from its past record very deservedly so. It was introduced into Georgia in 1856 by Maj. John Le Conte, and it takes its name from him. He planted the first two trees, and they are still alive, and are vigorous and healthy and bear bountiful crops of fruit yearly. From these two ancestors have sprung the thousands of trees planted around Thomasville and all over the South. The Le Conte is propagated from cuttings like the grape and the fig, and it therefore easily reproduces itself. It is a rampant grower, reaching at the age of 10 years 30 to 35 feet, with a spread of branches 25 to 30 feet It is practically blight proof and makes the best grafting stock for other pear trees yet known. It is not only a valuable fruit tree, but it is exceedingly handsome and adds very much to the appearance of the lawn The fruit is also large and handsome, a good shipper and sells well and is about six weeks ripening, thus giving ample time for marketing. This year, 300 trees produced a net revenue of $1,800. The writer sold from less than two (2) acres of ground $700 worth of pears after paying the sum of $280 to the transportation companies.

Farmers and land-owners think of such a net return from poor sandy ground and take courage, and would it not be well if our railroad managers would notice the amount of freight furnished from two acres of ground and in the future encourage fruit growing by giving good rates and efficient transportation to fruit growers!

By comparing the above figures with the incomes of our large cotton and corn farmers, it is not enough to induce them to diversify their industries. Fruit can be grown on a farm with very little additional expense, with other crops, and with absolute certainty if the proper kind of trees are selected. It is just as necessary to procure the kind of tree suited to your climate as it is the kind of oat or corn, if you would succeed. The ground for the orchard should be set apart for trees, and no stock allowed to go in, and it should be cultivated and not neglected, as is usually the case.

Yours truly,

T. E. Blackshear.

A little extra time in doing good work will not be missed 10 years from now.

ROTATION OF CROPS.

Some New Light on an Agricultural Topic of Great Interest.

Perhaps this subject engrosses the mind of the farmer as much as any other connected with his business. Many articles have been written on the subject, published in the agricultural journals, and discussed by the readers, and yet, today, many farmers are undecided as to which is the most successful course for them to pursue. In selecting a course for myself I bore in mind the fact that manure was of the most importance on the core and root crops, from the fact that the roots of corn go deeper than those of other crops in my rotation. I therefore start out with corn the first year with all the manure, spread from the wagon, (not dumped in piles to leach out for a month or more, and then scattered) before plowing. Then after corn has been gathered I plow in the fall if weather will permit, and sow in the spring to oats. After this crop is off, I seed it to wheat and clover. After allowing it to remain in clover two years I put it in wheat a second time, alowing all the fall crop of clover to remain and be turned in, and after wheat this time, I return to corn as in the start.

By this system, as the manure is turned under for corn, its roots generally find a portion, and when the piece is plowed for oats the rest of the manure comes to the suface to benefit the oats. After the wheat, which follows oats, the clover sowed with or upon it is cut the following spring and fall, but the second fall I plowed the second crop of clover to get as large as can be turned under for the next crop of wheat. Some years it may be best to allow the seed to be taken from the clover, with success depending on suitable weather for threshing; but upon the whole, in a series of years, I believe the additional quantity of wheat resulting from the green crop plowed under will overbalance the clover seed crop. The potatoes being planted the same year with the corn, and at the ends of the corn rows, get the full benefit of the manure plowed under. I believe potatoes should be planted deep. By making four or five hills of potatoes at the ends of corn rows it is better to turn the team upon in cultivating.

This system is based upon the fact that the roots of corn and potatoes go deep, while those of oats and wheat branch out horizontally at no very great debth. Consequently by the time I get through the rotation the land is in better heart than when I commenced.—*Cor. Ohio Farmer.*

LAZY FARMERS.

I used to get mad and cuss like a trooper when the Yankees said that Southern people were lazy. But I have had to acknowledge the fact. 'Tis true it is not real pleasant to think so, but facts are stubborn things to get around. And for twenty years stubborn facts have been accumulating that from beyond a doubt that we, as a people, are lazy and thoughtless.

Now here are some of the facts: Since 1865, the people of the cotton States have sent to the North for meat, bread, vegetables, horses and mules—$300,000,000 for just such things had they been as energetic as people should be, would have raised at home. The State of Georgia alone has sent $100,000,000 to pay for meat which, could easily have been raised at home.

Now, if every farmer in the cotton States had raised all he needed, and then enough to sell the people in the cities, all this money would have been kept at home, and what cotton we had would have brought double the money. Had this been done my brothers, do you think that there would have been a cry all over the land about the merchant?

I have said that every man who farms can raise all his family consumes. For the renter, who moves from place to place, this may be difficult, but for the man who owns his land, there is no earthly excuse for not having plenty of sweet potatoes and Irish potatoes, peas, beans, carrots, parsnips, salsify, turnips and dried fruits; and during the summer he can and should have as many vegetables as his family can consume besides enough to feed one pig for each member in his family and then raise plenty of corn to feed all his stock.—*Ex.*

Learn to think fast. The human brain is capable of lightning-like application, and there is no limit to its rapidity of application when rightly and directly applied.